We claim:

1. A method of removing mercury from flue gas produced by combustion devices burning mercury containing fuel, the flue gas containing particles and passing from a combustion zone in which the temperature exceeds 2600° F, through a first temperature zone in which the temperatures range from 1750° F to 2100°F, through a second temperature zone in which the temperatures range from 900°F to 1350°F and through a particle removal device, the method comprising introducing ammonia into the flue gas when the flue gas passes through the second temperature zone, the ammonia being introduced in sufficient amounts to oxidize mercury within the flue gas.

2. The method of claim 1 also comprising adding carbon monoxide to the flue gas.

3. The method of claim 2 in which the ammonia is introduced and the carbon monoxide is added by injecting urea into the flue gas such that ammonia and carbon monoxide are formed from the urea, wherein the urea is added to the flue gas stream at the second temperature zone and is added in sufficient amounts to oxidize mercury within the flue gas.

4. The method of claim 2 wherein the fuel is burned in a burner to produce initial flames and the carbon monoxide is added to the flue gas by adjusting air to fuel ratio in the initial flames in a manner to produce sufficient carbon monoxide so that enough

carbon monoxide will be in the flue gas when the flue gas passes through the second temperature zone to oxidize mercury present in the flue gas.

5. The method of claim 2 wherein the fuel is burned in a burner and the carbon monoxide is added to the flue gas by careful control of the size consistency of the fuel fired in the furnace to produce sufficient carbon monoxide so that enough carbon monoxide will be in the flue gas when the flue gas passes through the second temperature zone to oxidize mercury present in the flue gas.

6. The method of claim 2 wherein the fuel is burned in a burner and the carbon monoxide is added to the flue gas by biased firing to the burners produce sufficient carbon monoxide so that enough carbon monoxide will be in the flue gas when the flue gas passes through the second temperature zone to oxidize mercury present in the flue gas.

7. The method of claim 1 wherein the ammonia is added to the flue gas prior to passage of the gas through the second temperature zone, the ammonia being added in sufficient amounts so that enough ammonia will be present in the flue gas when the flue gas reaches the second temperature zone to oxidize mercury within the flue gas.

8. The method of claim 1 also comprising taking a sample of the flue gas from the second temperature zone and measuring an amount of carbon monoxide present in the flue gas.

9. The method of claim 1 also comprising injecting a gaseous or gas producing hydrocarbon fuel into the flue gas before the flue gas enters the second temperature zone.

10. A method of removing metals from flue gas produced by combustion devices burning fuel containing those metals, the flue gas containing particles and passing from a combustion zone in which the temperature exceeds 2600° F, through a first temperature zone in which the temperatures range from 1750° F to 2100°F, through a second temperature zone in which the temperatures range from 900°F to 1350°F and through a particle removal device, the method comprising introducing a material into the flue gas that controls free radical Cl when the flue gas passes through the second temperature zone in sufficient amounts to oxidize the metals within the flue gas.

11. The method of claim 12 wherein the material is a material selected from the group consisting of ammonia, urea, hydrochloric acid and carbon monoxide.

12. The method of claim 10 wherein the metals are selected from the group consisting of chromium, arsenic, selenium, cadmium, mercury, and lead.

13. A method of removing metals from flue gas produced by combustion devices burning fuel containing metals, the flue gas containing particles and passing from a combustion zone in which the temperature exceeds 2600° F, through a first temperature zone in which the temperature ranges from 1750° F to 2100°F, through a second

temperature zone in which the temperatures range from 900°F to 1350°F and through a particle removal device, the method comprising introducing a material into the flue gas that affects the flue gas in a manner to optimize Cl oxidation of elemental metals in the second temperature zone.

14. The method of claim 13 wherein the material is a material selected from the group consisting of ammonia, urea, hydrochloric acid and carbon monoxide.

15. The method of claim 12 wherein the metals are selected from the group consisting of chromium, arsenic, selenium, cadmium, mercury, and lead.